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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Horst Becker

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EXAMINER

CHEN, CHRISTINE

ART UNIT

PAPER NUMBER

4116

MAIL DATE

DELIVERY MODE

11/28/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/508,735	Applicant(s) BECKER ET AL.	
	Examiner Christine Chen	Art Unit 4116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

Claims 1-17 are cancelled by applicant. Claims 18-35 are pending and presented for examination.

Election/Restrictions

Examiner has decided to withdraw the restriction on the grounds that all claims filed were drawn to a single invention, resulting in claims 18-35 pending for examination. In addition, applicant's election with traverse of group I in the reply filed on October 22, 2007 is acknowledged.

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The word "means" can be found in the abstract on lines 7 and 16.

2. The abstract of the disclosure is objected to because the numbering corresponding to the drawings is misleading.

(2) follows the phrases "heat-treatment of parts" (line 3), as well as "outer wall" (line 13).

(4) follows the phrases "rotary hearth" (line 4) and "outer wall" (lines 5 and 7).

(Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. The term "substantially" in claims 20, 21, 30 and 32 is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear in what regard the term "substantially" is used when placed in the instant claims.

3. The term "vertically above" in claim 23 is a relative term which renders the claim indefinite. The term "vertically above" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Being that the furnace chamber is circular in shape, it is unclear as to what the term "vertically above" refers.

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4. Claim 30 is unclear. It is dependent on claim 21, which states that two openings are at a circumferential distance of 45° from each other. Claim 30 is drawn to the installation as claimed in claim 21, wherein one of said vertically movable doors is disposed in said circumferential distance of 45° between the first and the second opening. However, if the two openings are 45° apart from each other, it is not possible to have a movable door 45° between the two openings. It must be at an angle less than 45°.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 18, 21, 22, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (GB 2,162,294 A hereinafter A1) in view of Edenhofer (US 5,722,825 hereinafter A2) and Reuter (US 5,035,405 hereinafter A3).

Claim 18 is drawn to an installation for the heat-treatment of parts. Claims 21, 22, 27, and 28 further limit claim 18. In claim 21, the two openings are 45° from each other. In claim 22, the openings are both provided as charging and discharging openings. In claim 27, at least one of the openings has a pusher device. In claim 28, the installation further comprises a vertically movable door. In claim 29, the installation wherein all doors are individually controllable.

In regards to claim 18, Paul (A1) teaches a rotary hearth furnace with an outer and inner wall (p. 2, right-hand column, li. 81-83) for limiting a furnace chamber. In addition, “the rotary drive means is constructed to operate stepwise with a predetermined conveying stroke corresponding to an integral fraction of the rotary hearth circumference (p. 4, left-hand column, li. 28-31).” This construction allows the rotary hearth furnace to operate in a timed manner. Furthermore, Paul (A1) discloses movable partitions that separate the different treatment zones, which includes a heating-up zone and at least one treatment zone (abstract). The partitions are vertically moveable (p. 2, right-hand column, li. 118-123). Paul however fails to teach the remaining limitations of claim 18.

Edenhofer (A2) teaches a heat-treatment device with two openings, one for introducing workpieces into a furnace and another for removing the workpieces from the furnace (abstract). Both openings are closable by furnace doors (col. 4, li. 3-5 and col. 5, li. 16-18). Edenhofer (A2) also teaches the use of a pushing device for pushing the workpieces in and out of a furnace (col. 2, li. 41-47). Edenhofer (A2) also teaches a cooling chamber following furnace treatment, preferably a gas quenching chamber or a quenching bath (col. 3, li. 24-31).

Reuter (A3) teaches an apparatus in which a sluice chamber **12** connects a sluice valve **11** and a quenching container **17** (see figure).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Paul (A1) with the 2 openings, a pusher device, and a quenching bath as taught by Edenhofer (A2) so that the process time can be decreased, and a

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sluice chamber connecting an opening and quenching bath as taught by Reuter (A3) since those are commonly used elements used in a quenching chamber.

In regards to claim 21, Paul (A1) discloses that “forms of construction are also known in which separate apertures and/or flaps for loading the furnace and/or for removing the treated stock are provided juxtaposed at close intervals (p.1, li. 26-30).” Therefore, it would have been obvious to try and vary the distance between the two openings until a desired distance between the two openings was determined.

In regards to claim 22, Paul (A1) teaches an opening for charging and discharging. Therefore, it would have been obvious to have the two openings utilized for charging and discharging, as it is a simple variation of what is taught in this prior art. Furthermore, it would allow for more flexibility in terms of production methods to have the openings be utilized to both charge and discharge.

In regards to claim 27, Edenhofer (A2) discloses a furnace door **6a** between the turntable **5** and carburization furnace **6** (see Figure 1), therefore the pusher device must convey the parts through the opening in order to move the parts between the turntable and furnace.

In regards to claim 28, being that Paul (A1) discloses that the movable partitions separate the treatment zones (p. 1 li. 130- p. 2, li. 1-3), it would be obvious that the partitions can be used to change the length of the treatment zones.

In regards to claim 29, Paul (A1) teaches “simultaneously movable partitions (abstract).” The concept of having all the doors being individually controllable is a variation of what was in the prior art. It would have been obvious to try having all the

doors being individually controllable, as this would increase the amount of flexibility in production.

3. Claims 19, 20 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (A1) in view of Edenhofer (A2) and Reuter (A3) as applied to claim 18 above, and further in view of Mahr (US 3,693,812 hereinafter A4).

Claims 19, 20, and 23 further limit claim 18. Claim 19 is drawn to the installation further including a charging sluice disposed adjacent said first opening. Claim 20 is drawn to the installation wherein said sluice means and said charging sluice have at least one sluice door each disposed substantially at right angles to the associated opening in said outer wall. Claim 23 is drawn to limitations on the location of the first opening and charging sluice.

While Paul (A1) in view of Edenhofer (A2) and Reuter (A3) support a prima facie case of obviousness for claim 18 as seen above, they fail to teach the limitations of claims 19 and 20.

Mahr (A4) however teaches a furnace charging apparatus that has two charging sluices, both of which are adjacent to doors or openings (col. 2, li. 34-35). Therefore it would have been obvious to modify Paul (A1) in view of Edenhofer (A2) and Reuter (A3) with the charging sluice adjacent to a door opening, since this placement is well known in the art. It is also convenient and allows for an organized way of production.

In addition, Mahr (A4) teaches that the sluice doors are open and closed at given times during the charging cycle to allow material to pass into and from the sluices (col. 2, li. 36-39). Therefore, while Mahr (A4) does not specify the location of the sluice

doors to be as stated in claim 20, he notes the function of the sluice doors. Additionally, their location is dependent on their function. Therefore, in the case of the instant invention, it would have been obvious to have the sluice doors disposed substantially at right angles to the associated opening in said outer wall.

In regards to claim 23, the phrasing of “vertically above” is unclear, being that the furnace is circular in shape. Therefore, Paul (A1) teaches an opening for charging in a furnace chamber and Mahr (A4), teaches a charging sluice followed by an opening as stated previously in discussion on claim 19. In addition, Mahr (A4) teaches, “charging sluices are disposed above the furnace (col. 1, li. 54-56).”

4. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (A1) in view of Edenhofer (A2) and Reuter (A3) as applied to claim 18 above, and further in view of Myers (US 2,892,744 hereinafter A5).

While Paul (A1) in view of Edenhofer (A2) and Reuter (A3) support a prima facie case of obviousness for claim 18 as seen above, they fail to teach the limitations of claims 24-26.

Claims 24-26 further limit claim 18. Claim 24 is drawn to the installation wherein a second quenching means is connected to the rotary hearth furnace by means of said sluice means. Claim 25 is drawn to the installation wherein the second quenching means is either a quenching bath or a gas quenching chamber. Claim 26 is drawn to the installation wherein said first and second quenching means are operated at different temperatures.

In regards to claim 24, as previously discussed in a response to claim 18, Reuter (A3) teaches a quenching means connected to a furnace by a sluice (see figure). Therefore, it would have been obvious to one of ordinary skill in the art that if there were two quenching means, they would both be connected to the furnace in the same manner.

In regards to claim 25, Edenhofer (A2) teaches a cooling chamber that may be a gas quenching chamber or a quenching bath (col. 3, li. 28-31).

In regards to claim 26, Myers (A5) teaches the use of two quench tanks that operate at different temperatures (col. 3, li. 45-50). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Paul (A1) in view of Edenhofer (A2) and Reuter (A3) with the two quench tanks operating at different temperatures as taught by Myers (A5) in order to achieve a tempering effect (Myers (A5) (col. 3, li. 44-50)).

5. Claims 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (A1) in view of Edenhofer (A2) and Höhne (US 4,622,006 hereinafter A6).

Claim 31 is similar to claim 18. It is drawn to a rotary hearth furnace for the heat-treatment of parts. Claims 32-34 further limit claim 31. In claim 32, the heating zone extends over an area of substantially 90° between said first and said second opening. In claim 33, at least two treatment zones with different temperatures and atmospheres are provided each adjoining said heating zone. In claim 34, doors are provided on both sides next to the opening for charging and discharging.

As previously discussed in response to claim 18, Paul (A1) teaches a rotary hearth furnace adapted to be rotated in a timed manner, an outer and an inner wall for limiting a furnace chamber, and vertically movable doors for dividing said furnace chamber up into a heating zone and at least one treatment zone. As previously discussed in response to claim 22, Paul (A1) teaches an opening to be used for both charging and discharging. In addition, Paul (A1) teaches the opening to be adjacent to a loading and unloading zone, followed by a heating-up zone (abstract). Therefore the charge, following entrance to the furnace, enters the heating zone. While Paul (A1) does not teach the opening to be adjacent to the heating zone (no addition of loading/unloading zone), it would have been obvious from the prior art to do so, as it is simply a variation on what was taught in the prior art.

As previously discussed in response to claim 18, Edenhofer (A2) teaches two closable openings disposed in the outer wall of a furnace with the second opening at a distance from the first opening.

Höhne (A6) teaches a rotary hearth which may be rotated in either direction (col. 4, li. 34-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Paul (A1) with the 2 openings as taught by Edenhofer (A2) so that the process time can be decreased and with the ability to rotate in either direction as taught by Höhne (A6) which would allow for more flexibility of production.

In regards to claim 32, as previously discussed in response to claim 31, Paul (A1) teaches a heating zone following an opening. In addition, as previously discussed

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in response to claim 18, Edenhofer (A2) teaches two openings. Combining these references, it would have been obvious to have the heating zone between the two openings, being that the furnace may rotate both clockwise and counterclockwise. In addition, it would have been obvious to try and vary the heating zone area between the two openings until a desired area was determined.

In regards to claim 33, Paul (A1) teaches a rotary hearth with treatment zones with different temperatures and atmospheres. There is an unloading zone followed by a heating-up zone, a carburization zone, and a diffusion annealing zone (abstract). While Paul (A1) does not teach two treatment zones adjoining the heating zone (no addition of loading/unloading zone), it would have been obvious from the prior art to do so, as it is simply a variation on what was taught in the prior art.

In regards to claim 34, Paul (A1) teaches a rotary hearth furnace wherein doors **9** and **12** are provided on both sides next to the opening for charging and discharging so that a charging and discharging zone **16** is provided (Figure 1).

6. Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Paul (A1) in view of Edenhofer (A2), Höhne (A6), and Reuter (A3).

Claim 35 is similar to claims 18 and 31. It is drawn to an installation for the heat treatment of parts. The limitations found in claim 35, from the line “a rotary hearth furnace including:” to “said rotary hearth being adapted to be rotated in both directions” are found to be obvious. Discussion can be found under a response to claim 31.

Likewise, as stated previously in a response to claim 18, Edenhofer (A2) teaches transport means for transporting said parts into and out of the hearth furnace, and a

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quenching means, while Reuter (A3) teaches a sluice disposed adjacent the second opening. Reuter (A3) also teaches a sluice means to connect an opening and a quenching bath.

In addition, as stated previously in a response to claim 25, Edenhofer (A2) teaches a quenching means designed as a quenching bath.

As stated previously in a response to claim 22, Paul (A1) teaches an opening used for both charging and discharging.

Edenhofer (A2) teaches a quenching bath **7** connected to an opening **7a** for a furnace **5** (Figure 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Paul (A1) with the 2 openings, pusher device, and a quenching bath as taught by Edenhofer (A2) so that the process time can be decreased, with a sluice chamber connecting an opening and quenching bath as taught by Reuter (A3) since those are commonly used elements used in a quenching chamber, and with the ability to rotate in either direction as taught by Höhne (A6) which would allow for more flexibility of production.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Chen whose telephone number is 571-270-3590. The examiner can normally be reached on Monday-Friday 8:30am-5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CC

/Vickie Kim/

Supervisory Patent Examiner, Art Unit 4116